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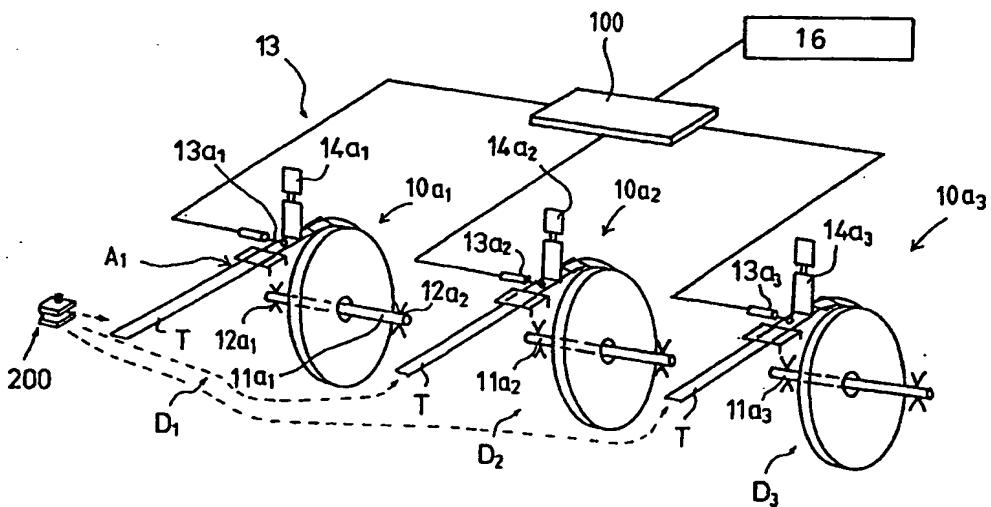
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<b>(71) Applicant:</b> VALMET CORPORATION [FI/FI]; Panuntie 6, FIN-00620 Helsinki (FI). <b>(72) Inventors:</b> TOIVANEN, Heikki; Pitkäläntie 10, FIN-40950 Muurame (FI). ESKELINEN, Ilkka; Kipparinpolku 9, FIN-78300 Varkaus (FI). <b>(74) Agent:</b> FORSSÉN & SALOMAA OY; Yrjönkatu 30, FIN-00100 Helsinki (FI).		<b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: EQUIPMENT AND METHOD IN HANDLING OF DOCTOR BLADES FOR A ROLL IN A PAPER/BOARD MACHINE



(57) Abstract

The invention concerns an equipment and a method in handling of doctor blades for a paper/board machine. The doctor blade (T) will be placed against the face of a roll in the paper/board machine so as to keep said face clean and to service said face. A doctor blade blank (T) is taken from a doctor blade roll (10a1, 10a2, 10a3 ...), i.e. from a reel. The equipment comprises a cut-off device (14a1, 14a2 ...) for cutting off the doctor blade material to the desired pull-out or blade length.

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Equipment and method in handling of doctor blades  
for a roll in a paper/board machine

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The invention concerns an equipment and a method in handling of doctor blades for a roll in a paper/board machine.

10 From the prior art, the use of various doctor blades is known. A doctor blade is an important part which secures the operation of a paper/board machine, which blade, fitted in connection with a roll, maintains the condition of the roll face and permits the passing of a web portion that is to be passed into the pulper out of connection with the roll. As is well known, doctor blades have been stored in connection with  
15 the paper/board machine on various shelves for doctor blades, from which shelves the doctor blade has been lifted straight into the doctor blade holder construction.

In the present patent application, a solution of an entirely novel type will be suggested for storage and preparation of doctor blades for a paper/board machine.

20 In accordance with the invention, a separate storage carriage is employed, which comprises at least one roll of doctor blades from which the doctor blade can be unwound. In accordance with the invention, the doctor blade material placed on the roll can be unwound through a separate measurement device and through a cut-off device. The cut-off device comprises a measurement device in its connection, from  
25 which measurement device the pulled-out length of the doctor blade and the residual length remaining in the roll can be read. At the desired point, the feed of the doctor blade from the roll is stopped, and the doctor blade is cut off to the desired length. The roll of doctor blades has been fitted around a shaft, which has been mounted  
30 revolving, and the band of doctor blades is passed through separate guides to the cut-off device, and a measurement detector of the measurement device is placed in direct vicinity of the cut-off device, which measurement detector measures the blade length

that has been fed. From a display placed in connection with a central unit, it is possible to read the blade length that has been fed out, and further, from the display it is possible to read the blade length that remains on the roll of doctor blades.

5 The roll of doctor blades is placed in a separate carriage, which can be shifted into different locations in connection with the paper/board machine. Thus, the same carriage can be used in different locations while the carriage comprises a number of different rolls of doctor blades and separate cut-off means and measurement detectors for said rolls of doctor blades.

10

The method and the equipment in accordance with the invention are characterized in what is stated in the patent claims.

15 The invention will be described in the following with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawings, the invention being, yet, not supposed to be confined to said embodiments alone.

20 Figure 1 is an axonometric view of a storage carriage for rolls of doctor blades, which carriage comprises, in accordance with the invention, separate positions for different reels of doctor blades or rolls of doctor blades as well as, for each roll, separate cut-off devices and measurement detectors for the device for measurement 25 of the length of the doctor blade. The cut-off doctor blade blank is provided with perforations and fastenings and is, after that, installed in connection with a roll in the paper/board machine.

30 Figure 2 is a schematic illustration of a roll of doctor blades, i.e. a reel of doctor blades 10a<sub>1</sub>, 10a<sub>2</sub>, 10a<sub>3</sub>, in accordance with the invention, wherein the blank of a doctor blade has been mounted on a shaft, which is provided with bearings, and wherein, in the vicinity of the feed-out end of the doctor blade, there is a detector of the measurement device and a cut-off device. Further, in the vicinity of the feed-out opening, there is a guide for the doctor blade. A doctor blade placed on the roll

can also be called a doctor blade blank, because a doctor blade blank that has been cut off to the specified measure is provided with perforations and required fastenings.

5 Figure 3 is a schematic illustration of the operation of an equipment in accordance with the invention as a block diagram presentation.

Fig. 1 is an axonometric illustration of a storage carriage 50 for rolls of doctor blades 10a<sub>1</sub>, 10a<sub>2</sub>, 10a<sub>3</sub>, which carriage comprises a frame R and an upper openable lid R<sub>1</sub> and a side cover R<sub>2</sub>. The rolls of doctor blades 10a<sub>1</sub>, 10a<sub>2</sub> and 10a<sub>3</sub> are placed in compartments D<sub>1</sub>, D<sub>2</sub> and D<sub>3</sub> inside the frame R. Each roll or reel of doctor blades 10a<sub>1</sub>, 10a<sub>2</sub>, 10a<sub>3</sub> has been mounted revolving on its shaft 11 by means of bearings 12a<sub>1</sub>, 12a<sub>2</sub>. For example, in connection with the feed-out opening A<sub>1</sub> of the compartment D<sub>1</sub> of the doctor blade roll 10a<sub>1</sub>, there is the measurement detector 13a<sub>1</sub> of the device 13 for measurement of the length of the doctor blade T as well as the cut-off device 14a<sub>1</sub> and at least one guide 15a<sub>1</sub>, 15a<sub>1</sub>'..... Based on the measurement signal produced by means of the measurement detector 13a<sub>1</sub>, the feed-out length of the doctor blade T that has been fed out and also the residual length remaining on the roll 10a<sub>1</sub> are computed in the central unit 100, and said measurement data can be read from the display 16. When the desired/estimated feed-out length of the doctor blade T has been reached, the cut-off device 14 is operated and the doctor blade T is cut off. In a corresponding way, the similar stations D<sub>2</sub> and D<sub>3</sub> comprise similar arrangements of equipment for the doctor blade rolls 10a<sub>2</sub>, 10a<sub>3</sub> connected with the stations. The feed-out length can also be estimated, in which case 25 no measurement device is used.

Fig. 2 is a schematic illustration of an equipment in accordance with the invention, which equipment comprises doctor blade roll stations D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub>, of which stations each station D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> is provided with a shaft 11a<sub>1</sub>, 11a<sub>2</sub>, 11a<sub>3</sub> of its own for a roll 30 of doctor blades 10a<sub>1</sub>, 10a<sub>2</sub>, 10a<sub>3</sub>, bearings 12a<sub>1</sub>, 12a<sub>2</sub> mounted on the shaft 11a<sub>1</sub>, 11a<sub>2</sub>, 11a<sub>3</sub>, and further a feed-out opening A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub> and in its connection measurement detectors 13a<sub>1</sub>, 13a<sub>2</sub>, 13a<sub>3</sub> for the measurement equipment 13, as well as a

display 16 for the display of the measurement information produced from each station D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub>. The central unit 100 operates as a collector/processor of the data and feeds out the measurement data along the bus e<sub>4</sub> to the display 16, which measurement data have been obtained based on the information produced by the measurement detectors 13a<sub>1</sub>,13a<sub>2</sub>,13a<sub>3</sub>. The cut-off device 14a<sub>1</sub>, 14a<sub>2</sub> and 14a<sub>3</sub> of each station D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub> can carry out the cutting-off of the doctor blade T based on the data read from the display 16. The cutting-off can be carried out by the operator of the carriage 50. In addition to the cut-off device, the equipment in accordance with the invention can also include a perforation device 200, by whose means pull-out holes can be perforated to the end/ends of the doctor blade. The perforation device can be fitted in connection with the cut-off device, or it can be a separate device which is independent from the cut-off device and which can be displaced to the desired position D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub>.

15 Further, the central unit 100 can include controls for the operation of the cut-off device 14a<sub>1</sub>,14a<sub>2</sub>,14a<sub>3</sub>, for example in connection with the lid R<sub>1</sub> of the carriage 50. Similarly, the display 16 can be placed in connection with the lid R<sub>1</sub>.

Fig. 3 is a block diagram presentation of the operation of the device in accordance with the invention. From the measurement detectors 13a<sub>1</sub>, 13a<sub>2</sub> or 13a<sub>3</sub> of the stations D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub> the measurement information n is passed along the data transfer buses e<sub>1</sub>,e<sub>2</sub>,e<sub>3</sub> to the central unit 100, and further from the central unit 100 there is a data transfer bus e<sub>4</sub> to the display 16 for reading of the information of the station D<sub>1</sub> and/or D<sub>2</sub> and/or D<sub>3</sub>. Optionally it is possible to read the length of the blade T that has been pulled out of the opening A<sub>1</sub> or A<sub>2</sub> or A<sub>3</sub>, in which case the cut-off device 14a<sub>1</sub> and/or 14a<sub>2</sub> and/or 14a<sub>3</sub> can be operated when the desired pull-out length has been reached. From the display 16 it is also possible to read, in respect of each station D<sub>1</sub> or D<sub>2</sub> or D<sub>3</sub>, the remaining blade length of the doctor blade roll 10a<sub>1</sub> or 10a<sub>2</sub> or 10a<sub>3</sub> placed in the respective station. The guide 15a<sub>1</sub>,15a<sub>1</sub>'....; 15a<sub>2</sub>,15a<sub>2</sub>'...;15a<sub>3</sub>,15a<sub>3</sub>'... controls the blade T in a controlled way past the measurement detector 13a<sub>1</sub>,13a<sub>2</sub>,13a<sub>3</sub> of each station D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub> and further past the cut-off device 14a<sub>1</sub>,14a<sub>2</sub>,14a<sub>3</sub> related to the station D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub>....

## Claims

1. An equipment in handling of doctor blades for a paper/board machine, which doctor blade (T) will be placed against the face of a roll in the paper/board machine  
5 so as to keep said face clean and to service said face, characterized in that a doctor blade blank (T) is taken from a doctor blade roll (10a<sub>1</sub>,10a<sub>2</sub>,10a<sub>3</sub>...), i.e. from a reel, and that the equipment comprises a cut-off device (14a<sub>1</sub>,14a<sub>2</sub>...) for cutting off the doctor blade material to the desired pull-out or blade length.
- 10 2. An equipment as claimed in claim 1, characterized in that the equipment comprises a measurement device (13), and the pull-out length can be read on the basis of the information transferred by the measurement detector (13a<sub>1</sub>,13a<sub>2</sub>,13a<sub>3</sub>...) of said measurement device (13) to the central unit (100) in order to cut-off the desired length of a doctor blade.  
15
- 15 3. An equipment as claimed in any of the preceding claims, characterized in that the equipment comprises a display (16) in connection with the central unit (100), from which display it is possible to read the length pulled out from a doctor blade roll (10a<sub>1</sub>,10a<sub>2</sub>,10a<sub>3</sub>...), based on the information transmitted by a measurement detector (13a<sub>1</sub>,13a<sub>2</sub>,13a<sub>3</sub>...) of the measurement device (13), so as to determine the correct cut-off point.
- 20 4. An equipment as claimed in any of the preceding claims, characterized in that the measurement detector (13a<sub>1</sub>,13a<sub>2</sub>...) and the cut-off device (14a<sub>1</sub>,14a<sub>2</sub>...) are placed in the vicinity of the blade (T) feed-out opening (A<sub>1</sub>,A<sub>2</sub>...) of the doctor blade roll station (D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub>...), and that the doctor blade blank (T) can be controlled by means of a guide (15a<sub>1</sub>,15a<sub>1</sub>';15a<sub>2</sub>,15a<sub>2</sub>') in a controlled way out of the doctor blade roll station (D<sub>1</sub>,D<sub>2</sub>,D<sub>3</sub>...).  
25
- 30 5. An equipment as claimed in any of the preceding claims, characterized in that the doctor blade rolls (10a<sub>1</sub>,10a<sub>2</sub>,10a<sub>3</sub>...) have been fitted on shafts (11a<sub>1</sub>,11a<sub>2</sub>,11a<sub>3</sub>) of their own, which have been mounted by means of bearings (12a<sub>1</sub>,12a<sub>2</sub>...).

6. An equipment as claimed in any of the preceding claims, characterized in that the central unit (100) is connected with a data transfer bus (e<sub>1</sub>, e<sub>2</sub>, e<sub>3</sub>) passing from the measurement detector (13a<sub>1</sub>, 13a<sub>2</sub>, 13a<sub>3</sub>) of the measurement device (13), and that there is a data transfer bus (e<sub>4</sub>) from the central unit (100) to the display (16).

5

7. An equipment as claimed in any of the preceding claims, characterized in that the doctor blade rolls (10a<sub>1</sub>, 10a<sub>2</sub>, 10a<sub>3</sub>) in each doctor blade roll station (D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub>) are placed in a storage carriage (50), which storage carriage (50) comprises wheels (50a<sub>1</sub>, 50a<sub>2</sub>, 50a<sub>3</sub>, 50a<sub>4</sub>) for moving the storage carriage (50), in which case the 10 storage carriage can be shifted readily to the desired location in connection with the paper/board machine.

8. An equipment as claimed in claim 1, characterized in that the equipment further comprises a perforation device (200) for perforation of pull-out holes to the end/ends 15 of the doctor blade.

9. A method in handling of doctor blades for a paper/board machine, which doctor blades are meant to be used in connection with rolls of a paper/board machine for servicing of their roll faces, characterized in that, in the method, a doctor blade 20 blank is guided from a doctor blade roll (10a<sub>1</sub>, 10a<sub>2</sub>, 10a<sub>3</sub>...) to a cut-off device (14a<sub>1</sub>, 14a<sub>2</sub>, 14a<sub>3</sub>), and that there is a measurement device (13) and therein a measurement detector (13a<sub>1</sub>, 13a<sub>2</sub>, 13a<sub>3</sub>), and the length of the doctor blade pulled out from the doctor blade roll can be read based on the information transmitted by said detector in order to determine the correct cut-off point of the doctor blade (T), and 25 that by means of the cut-off device (14a<sub>1</sub>, 14a<sub>2</sub>, 14a<sub>3</sub>) the doctor blade (T) that has been pulled out is cut off to the desired cut-off length.

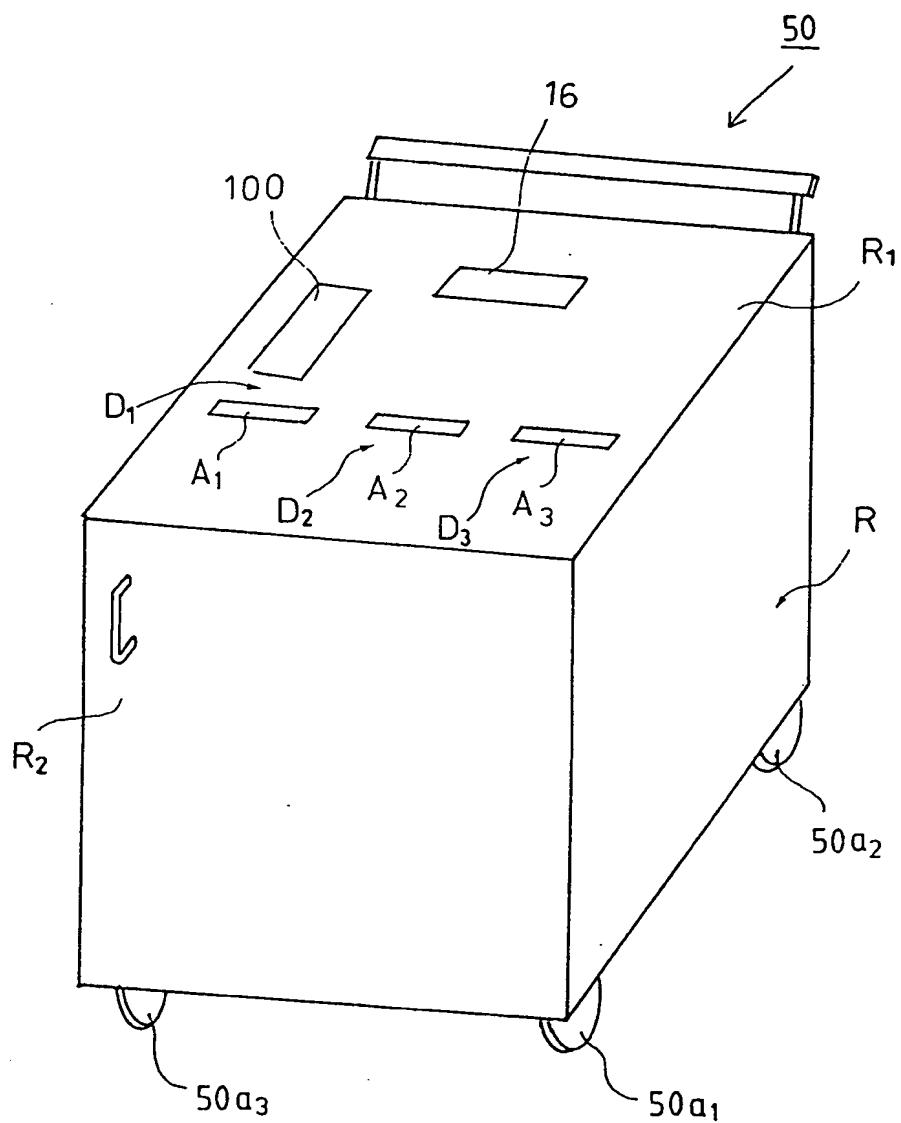


FIG.1

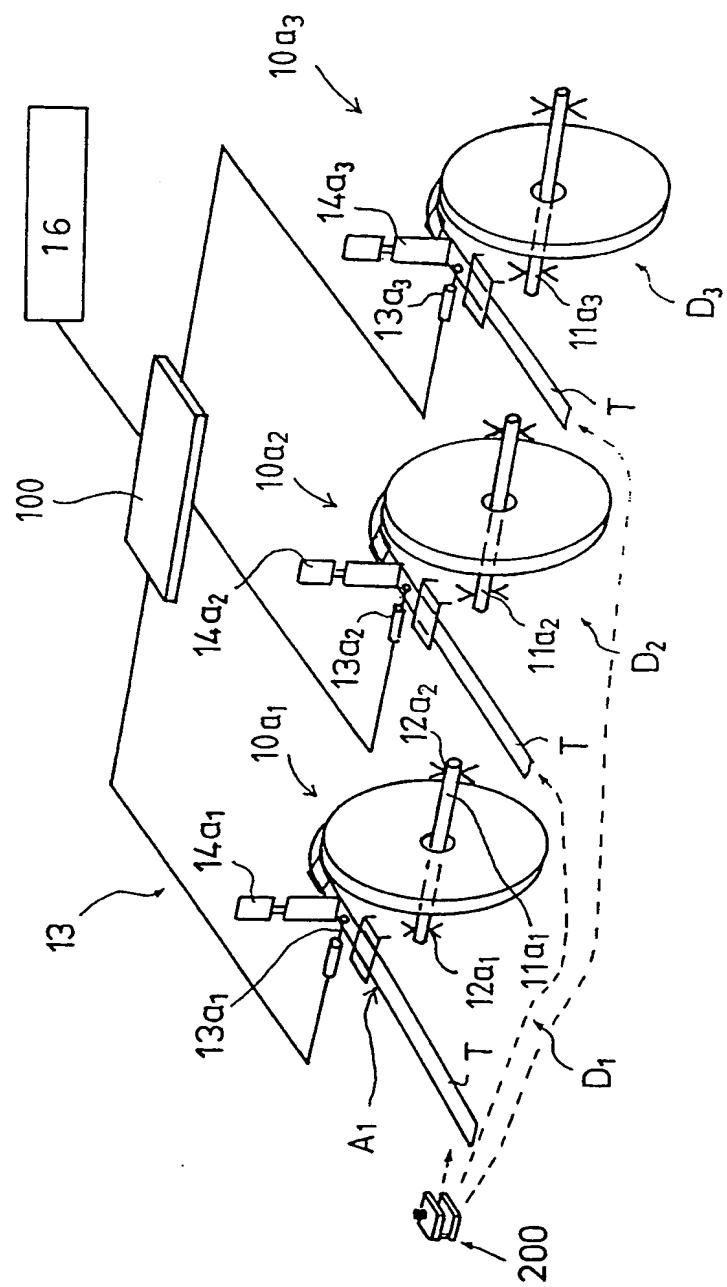


FIG. 2

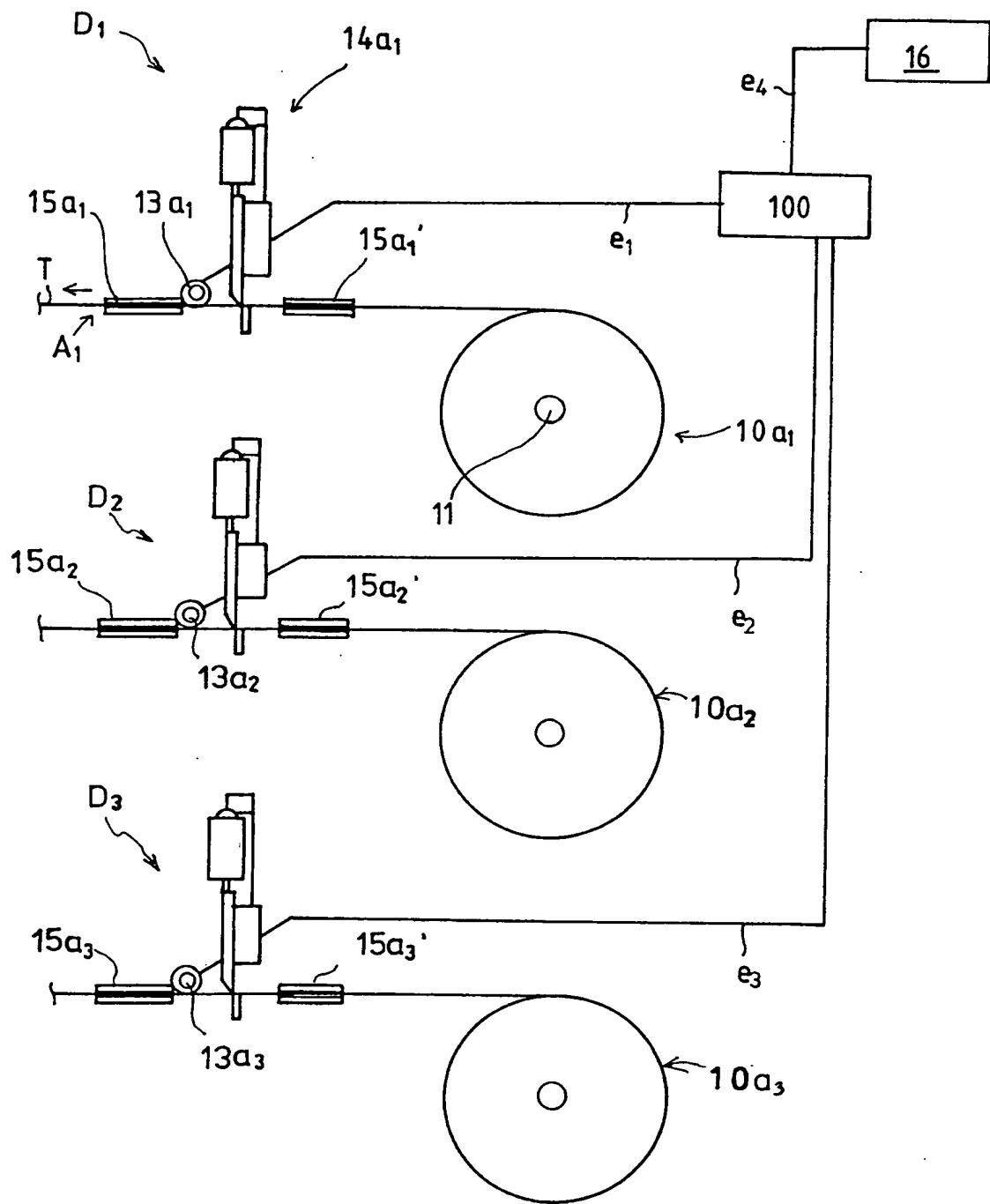


FIG. 3

1  
INTERNATIONAL SEARCH REPORTInternational application No.  
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A. CLASSIFICATION OF SUBJECT MATTER		
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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US 3810588 A	14/05/74	NONE	
US 3318443 A	09/05/67	NONE	
GB 759531 B	17/10/56	NONE	